

What is claimed is:

1. A mass spectroscope comprising:

an ion source for generating ions,

a mass spectrometry portion for analyzing the ions,

5 an ion retention portion arranged between the ion source and the mass spectrometry portion for storing, cooling the ions and dissociating the ions,

a gas supply connected to the ion retention portion for supplying a gas to the ion retention portion,

10 flow adjusting means disposed between the ion retention portion and the gas supply for adjusting a flow of the gas supplied to the ion retention portion, and

control means connected to the flow adjusting means for controlling the flow adjusting means to maintain an inner  
15 pressure of the ion retention portion according to operation modes at the ion retention portion.

2. A mass spectroscope according to claim 1, wherein said operation modes include an introducing operation in which the ion  
20 is introduced from the ion source into the ion retention portion, a retention operation in which the ion is stored, cooled and dissociated in the ion retention portion, and a discharging operation in which the ion is discharged from the ion retention portion to the mass spectrometry portion, said control means  
25 controlling the flow adjusting means so that the gas pressure of the ion retention portion in the retention operation is higher than those in the introducing and discharging operations.

3. A mass spectroscope according to claim 2, wherein said flow adjusting means is a pulse valve for quickly opening and closing gas flow from the gas supply.

5 4. A method for analyzing ions, comprising:

generating the ions in an ion source,

introducing the ions from the ion source into an ion retention portion,

increasing a pressure in the ion retention portion, and

10 discharging the ions from the ion retention portion to a mass spectrometry portion for analyzing the ion after the pressure in the ion retention portion is decreased.

5 15 5. A method for analyzing ions according to claim 4, wherein said gas is introduced into the ion retention portion only while the ions are retained in the ion retention portion.

6. A method for analyzing ions according to claim 4, wherein said gas is maintained at a pressure about  $6 \times 10^{-3}$  [Pa] in the retention operation.

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